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THE OSPREY

AN ILLUSTRATED MONTHLY MAGAZINE of BIRDS & NATURE

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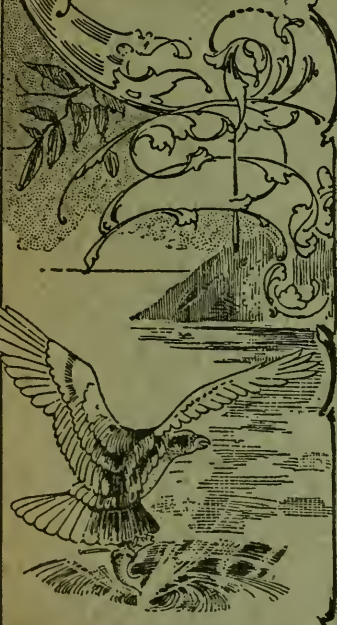

CONTENTS.

Notes of some Yellow-throated Vireos' Nests. By William R. Maxon ... 37
The Birds of the Marianne Islands and their Vernacular Names.—I. By W. E. Safford ... 39
Notes of McCown's Longspur in Montana. By P. M. Silloway ... 42
The Carib Grassquit (*Euetheia Bicolor Omissa.*) By B. S. Bowdish ... 45
Board and Lodging of Birds ... 48
An Albino Vesper Sparrow. By R. W. Williams, Jr. ... 49
The Thick-billed Redwing. A New Bird Record for Iowa. By Paul Bartsch ... 49
Biographical Notice of John Cassin. By Theodore Gill ... 50
REVIEWS ... 54
OBITUARIES ... 56

SUPPLEMENT.

GENERAL HISTORY OF BIRDS ... 13-14

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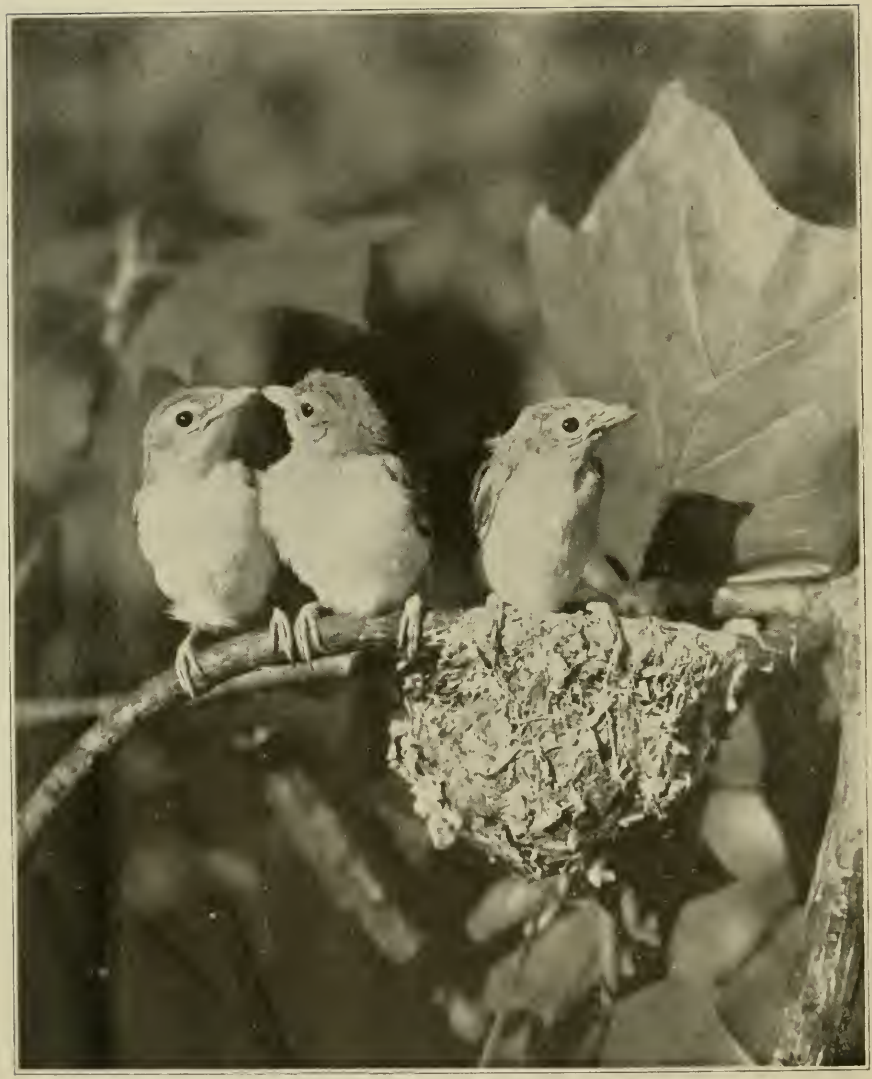


THE TRIO AT HOME.

THE OSPREY.

An Illustrated Magazine of Popular Ornithology.

Published Monthly.

VOLUME I. (New Series). MARCH, 1902. NUMBER 3.

NOTES ON SOME YELLOW-THROATED VIREOS' NESTS.

By WILLIAM R. MAXON.

Most of us who are fond of birds have our particular favorites,—species which for one reason or another or for many reasons or none at all appeal most strongly to our affection. The Wood Pewee holds first place with me. The subdued tints of his plumage, his alert behavior and plaintive querulous note somehow commend him to my favor. Such another favorite, but a bird of quite different parts is the Yellow-throated Vireo. Though not brilliant his colors surpass those of the Pewee, and his notes denote a stronger frame, a more robust spirit. In both, according to my observation, there is the same neighborly interest "in the affairs of men;" but I knew the Pewee well, before I had even tried to master the Vireos. Primarily dwellers in the woodlands the Vireos of our day are nearly as common in the towns. The Red-eyed is still most abundant in the light woods and orchards; but the Warbling has come to be just as truly a bird of town shade trees. In Central New York the Yellow-throats are about equally divided between the shaded villiage streets and the patches of woods nowhere very extensive in that farming locality. Not infrequently they may be heard from the tree-tops of the city parks; and how pleasantly then, their ringing music contrasts with the babel of English Sparrows in the street.

My first Yellow-throated Vireo's nest was found in the village of Oneida Castle, N. Y., in one of the lower drooping branches of a maple shade tree, just over the sidewalk, and about fifteen feet from the ground. According to my recollection it was so overrun with minute lice that the young birds were dead. My inspection of the nest was brief; but it served as a revelation in the wonders of bird architecture, and I have yet to learn of a race of more expert builders. The next nest was near by at Oneida, (June 14, 1894), on the outskirts of the village, about thirty-five feet up in a hickory, and above the sidewalk. It appeared to be quite completed; but a visit several days later found the nest still without eggs, and I took it the birds had deserted. Happening that way in late July I noticed that a brood had been raised in the interim.

On June 26, 1895, I found another nest some forty feet up in a large maple shade tree at Constantia, N. Y.,—and, as before, directly over a sidewalk. It was attached, like the last, to a rather thick branch and not far from the main tree-trunk. Having climbed up to investigate I found three or four very small occupants to the nest, and decided to watch feeding operations at close range. But alas for my decision! I was far from showing proper caution. One of the birds came with food while I was close by the nest and betrayed but mild curiosity till the mate, beak full, appeared. Then there ensued a muffled discussion; and it was soon evident from their very pronounced uneasiness that inquisitive folk were by mutual understanding barred from the tree. By partially withdrawing, and sitting quietly, I spent some time in trying to induce a less harsh ultimatum; but the ethics of the case were plainly on the parents' side, and fearing that harm might come to the youngsters by enforced abstinence I left the tree. Hardly had I done so when happy domestic relations were resumed. Unfortunately I had no glass.

About Washington I have seen but two nests. The first of these (June 7, 1901), thirty feet up in a giant beech in the 'Zoo' was rather too far out on a limb for purposes of photography. One of the parents upon leaving the nest was seen by Mr. Bartsch to swallow ordure of the young. My last and most satisfactory experience—pleasant enough to atone fully for past failures —was with a brood of three at Dyke, Virginia. The Washington contingent know what a delightful 'birdy' spot this is; wooded slopes with a winding path or two, thick undergrowth in places, a spring and a level stretch of low woodland bordered by a marshy arm of the Potomac where the golden club (*Orontium*) flourishes and the Marsh Wrens gurgle all day long. On June 9th last I had been wading in the marsh for Wrens' nests and was making for dry land when I fell in with a faintly piping Vireo youngster crouched on an alder branch at the margin of the marsh. The least I could do was to rescue from eminent peril and carry to shore the vagabond. And there I beheld the amiable junior editor of this journal closed jack-knife fashion on a slender tulip, half way to the nest. The one bird within the nest foreseeing possible disaster poised on the rim and fluttered to the ground. When the nest and branch had been got, they were set up within range of the camera, and the two birds posed with some success for snapshots. Shortly, a few faint chips close by proclaimed another scion, and in a moment the nest complement of three was completed. We tried to coax the parent to feed the youngsters at the nest. With food in her beak she came tantalisingly near, and seemed each instant about to approach within range; but after all, the net result of her presence was to start the young birds on short flights. So we gave up the attempt, pretty well contented with a half dozen negatives of the trio at home.

To these records I may add a third,—that of a nest observed by Mr. Bartsch at Falls Church, Va., on June 5th, 1901. This was situated twenty feet from the ground in a maple, eight feet from the trunk. The nest and young were photographed.

THE BIRDS OF THE MARIANNE ISLANDS AND THEIR VERNACULAR NAMES.—I.

By W. E. Safford.

The Marianne Islands, also known as the Ladrones, compose an archipelago of small volcanic islands forming a chain from north to south about four hundred miles long between the latitudes 13° 14′ and 20° 30′ North and the meridians 142° 31′ and 143° 46′ East longitude.

Guam, or Guáhan, the most important member of the group, is the only island belonging to the United States, the rest having been sold by Spain to Germany. The islands may be separated into three groups. The southernmost, consisting of Guam, Rota, Aguigan, Tinian and Saipan, is probably the oldest geological formation and contains no active volcanoes. Next come the Farallon de Medinilla, Anatahan, Sarigan, Guguan, Alamagan, Pagan and Agrigan, all of them rocky and precipitous and several of them having active volcanoes. Finally come three volcanoes rising from the sea: Asongson, Urracas and Pájaros, the last of which is in full activity.

The group was discovered by Magellan, March 6, 1521, but no settlement was made upon it for nearly one hundred and fifty years, when, on June 16, 1668, Padre Diego Luis de Sanvitores arrived at Agaña, on the Island of Guam, sent thither at his own request to establish a mission for the purpose of converting the natives to the Christian religion. He and his companions were received with great kindness by the natives who erected for them a church at Agaña. But misunderstanding arose. The Spaniards incurred the ill will of the natives, and after having zealously worked for nearly four years among them Padre Sanvitores was killed by a chief named Matapang for baptising a child against his will. A war of "reduction" now began, but the natives were not subdued until after twenty-three years of bloodshed, the final "victory" over them being won on the island of Aguigan, in July, 1695, by "the valliant Don José Quiroga".

The Jesuits remained on the Mariannes one hundred years, during which time the group was visited by the English Pirates Eaton and Cowley; by Dampier, who accompanied Captain Swan; by Woods Rogers, who had with him Alexander Selkirk, recently rescued from the Island of Juan Fernandez; by Anson, the famous circumnavigator; and by the English captains Wallis and Byron. On November 2, 1769, the Jesuits left Guam, their order having been banished from the Mariannes, as well as from all other posessions of Spain, by Carlos III. They were succeeded by friars of the order of San Agustino.

Both Dampier and Anson give interesting accounts of the island and their products; but no collection was made to illustrate their natural history until the early part of 1792, when Thaddeus Haenke, a Bohemian botanist, and Luis Née visited Guam and Tinian on their way from Acapulco to the Philippines, and made a collection of the plants. A number of these were described by Don Antonio José Cavanilles, Professor of Botany at Madrid, in 1801, in a work entitled "Descripcion de las plantas que Don Antonio Josef Cavanilles demonstró en las lecciones publicas del año 1801 precidida de los principios elementales de la botanica". In this work the author establishes a new genus of ferns which he called *Humata* from plants collected at Umata, Island of Guam.

In 1817 the islands were visited by Kotzebue, accompanied by Adelbert Chamisso, as botanist of his celebrated expedition. A narrative of the expedition was published giving interesting information concerning the natural history of the group, and in 1827 Chamisso published independently "Reise um die Welt; Bemerkungen und Ansichten auf einer Entdeckungsreise unter Kotzebue". But not until 1819 were systematic investigations made into the physical geography, geology, flora and fauna of the Mariannes. On March 17 of this year the expedition under Captain Louis Desaulses de Freycinet, reached Guam, the Uranie coming to anchor in the roadstead of Umata, on the southwest coast of the island, and remaining until the 6th of June. Attached to the expedition were Quoy and Gaimard as doctors and Gaudichaud as pharmacist, who also acted as naturalists, making a collection of the fauna and flora, Monsieur Gaimard also compiling a vocabulary of the language of the natives. Monsieur Arago, artist of the expedition, assisted them and afterwards wrote an independent but unreliable narrative of the expedition. Quoy and Gaimard's work on the zoology of the expedition is well-known, and in the report on botany many new plants are described by Gaudichaud. Several years afterwards, in 1828, Quoy and Gaimard again visited the group, this time on the corvette Astrolabe, under the command of Captain J. Dumont d'Urville.

The information given to the world by these expeditions was further augmented by the expedition of the Spanish corvette Narvaez commanded by Captain Sanchez y Zayas, and by Monsieur Alfred Marche, who collected on the islands from April 22, 1887 until the first part of May, 1889. The results of his work were published in an elaborate paper, by M. E. Oustalet entitled "Les mammifères et les oiseaux des îles Mariannes", in the 3rd Series of Nouvelles Archives du Muséum d'Histoire Naturelle de Paris", Vols. vii and viii. (1895-1896).

In the mean time, while M. Oustalet was working up M. Marche's material, two Japanese collectors were sent to the islands by Mr. Alan Owston of Yokohama, at the request of Mr. Walter Rothschild of the Tring Museum. They arrived in Guam in December, 1894, and remained until the following winter. Among the birds sent home by them were three specimens of a Rail, shot during the months of May, June and July, 1895, on the Island of Guam, six years after M. Marche had collected the same species. This was described by Mr. Rothschild as a new species, *Hypotaenidia owstoni*, and by M. Oustalet as *Hypotaenidia marchei*. Mr. Rothschild's description was published in Vol. ii of Novitates Zoölogicae, the journal of zoölogy of the Tring Museum, in 1895. During the latter part of the same year M. Oustalet's first paper on the Marianne fauna appeared, but the second paper, in which the description of the *Hypotaenidia* was given, did not appear until the following year. Mr. Oustalet's paper had probably been handed in for publication before the appearance of Rothschild's description, as he does not refer to the latter. After stating that the bird had been collected by Quoy and Gaimard, who wrongly referred it to *Rallus philippensis*, and giving a description of it in which he points out the peculiarities which distinguishe the birds collected by Marche from that species, M. Oustalet says: "Je me crois donc pleinement autorisé à les attribuer à une espèce inédite que je désignerai sous le nom *d'Hypotaenidia marchei*". In 1898 Mr. Ernst Hartert published a paper "on the birds of the Marianne Islands", in which he gives a résumé of all that was known regarding the bird fauna of the group. He recognizes Mr. Rothschild's name for the *Hypotaenidia*, and expresses doubt as to the occurrence of a distinct species of *Zosterops* on the island of Saipan and of an *Acrocephalus* on Pagan differing from the Guam species.

The last collection made in the Mariannes was in the summer of 1900, by Mr. Alvin Seale, of the Bernice Pauahi Bishop Museum of Honolulu. His labors were confined to the Island of Guam. The Director's Report for 1900, which has recently appeared, contains an acount of his "Mission to Guam," in which he describes a new bittern, heretofore believed to be *Ardetta sinensis* (Gmel.), besides a number of new fishes. As Mr. Seale makes me responsible for the vernacular names cited by him, and as several inaccuracies occur in them, as they appear in the report, I have ventured in the following list to give them correctly. I have also added a few notes taken while in Guam, and I refer to allied species occurring in Samoa.

In comparing the reports of the various explorers and collectors who have visited the Mariannes many discrepancies appear in the vocabularies compiled by them, especially in the vernacular names of the animals and plants in their collections. For the most part these discrepancies result from the various systems of orthography used,—Freycinet, Dumont d'Urville, Gaudichaud and Marche representing the sounds of the words according to the French system, Kotzebue and Chamisso by the German, and the Japanese collectors by a method of their own which I have not yet been able to decipher. The confusion has also been increased by spelling some of the words after the Spanish fashion, in which the Chamorro *h* is represented by the guttural Spanish *j*, and in which mute Spanish *h's* are placed at the beginning of words before vowels and interposed between vowels which do not form a diphthong. Thus for the name of the Island of Guam, which is Guáhan in the native vernacular, we have the French Gouaham and the Spanish Guajan, both of which names are misleading when read on a chart, if one is ignorant of the system of orthography which has been employed. The Spanish ear, moreover, is offended by a final consonant if the last syllable of a word be atonic, so that many geographical names in the islands are modified to such an extent that the original words in many cases cannot be recognized.

TO BE CONTINUED.

NOTES OF McCOWN'S LONGSPUR IN MONTANA.

By P. M. Silloway.

The first specimen of *Rhynchophanes mccownii* (Lawr.) that chanced under my observation were the subjects of extended ogling on my part. It was on April 24, 1899, on a cloudy, raw afternoon, when I had gone out upon the neighboring bench to look for evidences of a belated spring. In the bed of a miniature coulee that crossed my path was a bank of snow, sullenly giving way before the weak assaults of the advancing vernal season. Crouching under the lee of a small stone, and hugging the edge of the snow-bank, a new bird caught my eye. The stranger was apparently as interested in the featherless biped as I was in him, for he allowed me to approach until I could observe every detail of his handsome breeding plumage, so that there was no call for me to deprive him of the life he was supporting with so much hardihood along the line of melting snow. I can yet remember how the great tears crossed down my cheeks as I faced the raw south wind in my efforts to watch every movement of the Longspur and to take in every detail of his dress. Presently I observed a second McCown's Longspur lurking near the first, the advance guards of the troops that were soon to throng the prairies to rear their broods.

The following Sunday afternoon proved too attractive outdoors to be resisted, and while walking over the bench I suddenly found myself in the midst of a flock of McCown's Longspurs. They were crouching silently in the hollows of the road and in depressions of the ground, and I was not aware of their presence until I startled several near me. When flushed at my approach, after sitting undisturbed until I was only five or six feet away from them, six or eight of them would flitter farther away, uttering a sharp chipping note as they flittered to stations beyond me.

When I discovered myself among them, by looking carefully around me I could see them crouched upon the ground on all sides of me, their gray attire assimilating them as closely with the background that only by their black crescentic breast markings could I detect them. Frequently, however, some of them would emit their chipping call in a gentle tone, and thus I could note their positions. In several instances there were fifty of the flock crouched around me, their black breasts showing as black spots on the dreary gray herbage and prairie soil.

After spending some time in watching them, I moved away without startling them. When out of their midst, and about sixty yards to one side of their position, I was attracted by a series of strange songs, uttered with unusual force. Walking in the direction of the unfamiliar music, I found that the Longspurs were the authors, and for many minutes I watched different songsters twittering their pretty little songs. The performance was a continuous chatter, having some resemblance to portions of Meadowlark music. It was also quite similar to the continuous, hurried measures of the Horned Larks, though louder and clearer. In some instances the performer uttered the act of singing while pecking for seeds among the dead herbage, thus showing a further resemblance in habit to the Horned Larks. A noticeable feature of the performance was the movements of the white throats as the spirited measures bubbled forth.

In a wagon trip across many miles of prairie in the last week of May, 1899, I was regaled by the well-known flight-songs of the males of this species. Numbers of them were frequently seen in the air at one time, some of them mounting upward in irregular, undulating, star-like lines of movement, pouring forth their hurried bursts of song; others could be seen floating downward with outspread, elevated wings, uttering their ecstatic measures as they slowly floated to earth without moving a feather. This was in the best period of the breeding season, but circumstances rendered it necessary that I should neglect the desire to further my acquaintance with this Longspur at this time.

On May 26, 1900, I found my first evidence of the nidification of McCown's Longspur. A female was surprised in making a depression at the base of a tuft of lupine. She fluttered upward and away almost from under my feet. The depression was about finished and ready for the construction of the nest.

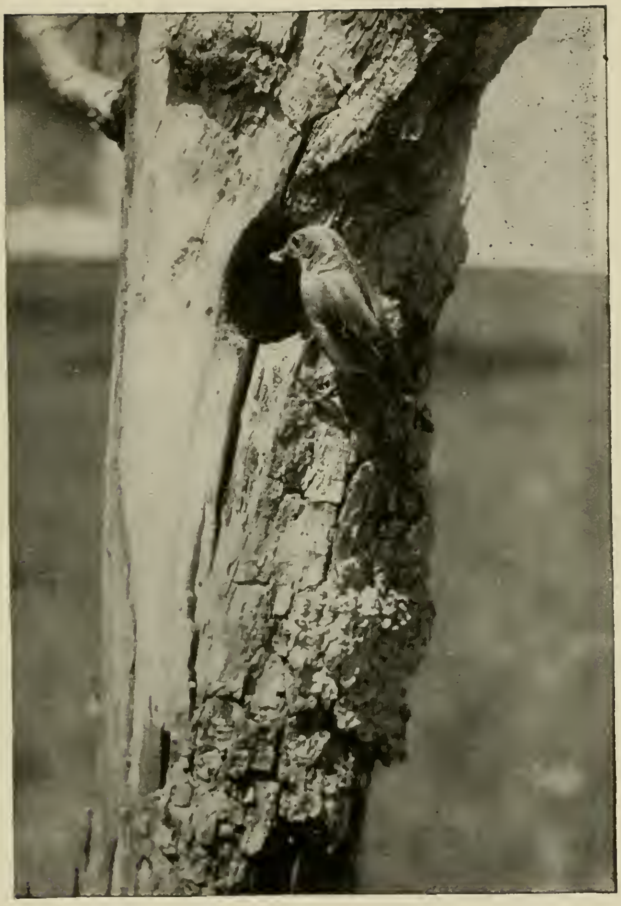
On May 27, the evidence became most convincing, as on that day I discovered a nest containing two young birds about three days old. This nest was in a depression at the base of a tuft of grass. The female was brooding her younglings so closely that I startled her from the nest when I was only three feet away.

My first nest containing eggs was found on May 19, 1900. It held four eggs, far advanced in incubation. The situation was on the high prairie or second bench, the site being a depression among grass blades, open above. The nest was made of dried grass felted at the bottom with a few downy pistils, the style of architecture being very similar to that of the Horned Larks. The cavity was two and one-half inches, major and minor axes, with a depth of two inches. The female flushed when I was about eight feet from the nest. The structure held together when removed with great care. The depression was three inches in diameter and two and one-half inches deep.

It seems that for some reason I had miscalculated the breeding period of McCown's Longspur, for the time of nidification had very generally passed when my first set with eggs was taken. On May 30, 1900, young Longspurs were seen on the prairie, a-wing for the first time, and nests containing young were regularly found, though most of them showed that the eggs had only recently yielded up their living treasures. It was evident that McCown's Longspur was breeding this season much earlier than the books allowed, and hence the only nests I found were those I chanced upon in trailing down nests of the Long-billed Curlew, *Numenius longirostris.* One nest I chanced to discover, containing three eggs, was left for further observation, as I was then busily engaged in playing hide-and-seek with a male Curlew; after finding the nest of the Curlew, however, the nest of the Longspur was overlooked in the excitement of the moment, and the next day I was not able to re-locate it.

It happened that my first nest with eggs for 1901, as for 1900, was found on May 29. The site was a depression at the base of a small Coronilla bush. The nest was made of dried grass, the interior diameter being two and three-fourths inches, and the depth two inches. The female was closely brooding her four eggs, as they were advanced in incubation, and she remained until I almost stepped upon her.

My record of nests of McCown's Longspur containing eggs closes with one taken on May 30. It was in an exposed position, in a depression among grass blades. As in other instances, it was discovered by flushing the female from the nest. The dimensions were very similar to those already given, and as in the other instances, the four eggs were advanced in incubation. Thus an experience of two seasons on the prairie warrants me in saying that the last week of May is none too early to look for good sets of eggs of this Longspur, in central Montana.



Female Blue Bird about to enter nest-hole with green insects larva. (From Herrick's Home Life of Wild Birds by courtesy of the publisher.)

THE CARIB GRASSQUIT (*EUETHEIA BICOLOR OMISSA.*)

By B. S. Bowdish.

This sprightly little Sparrow is abundant everywhere in Porto Rico where I went except on the smaller islands. In the island of Vieques it is the most abundant of the small birds and when the early morning sun is scintillating in a thousand diamond-like reflections from the dew-spangled foliage the hardly musical but nevertheless cheerful song of the Grassquit resounds from every bush-top.

The song is rather wheezy and insect-like, the alarm notes, sparrow-like though sharp, are less so than those of many sparrows and are readily distinguishable.

While particularly partial to the weedy and bush-grown fence-lines, roadsides and ditches, I have often met them in the thickest woods, and have a record of two nests in such situations, the nests built in a bank of climbing grass, referred to further on.

The food is almost entirely vegetable, chiefly grass and small weed-seeds.

The typical nest is globular with an entrance on the side about large enough to admit the bird, but sometimes this is quite large as in the specimen illustrated, and in extreme cases of poor architecture occupies about half of the side and top. They generally resemble nests of *Cœreba portoricensis* but are less bulky, and often less well built. They are situated from ten or twelve inches above ground, in clumps of grass and weeds, to twelve or fifteen feet, in trees, but by far the greater number are less than ten feet, usually not more than four or five. They are often little concealed, sometimes occupying quite conspicuous sites.

In one case a bank of climbing grass was growing in a dense wall among the trees in quite thick woods on a hill in the island of Vieques. A nest was built into this wall of grass with nothing but the twig opening to reveal it, being built entirely of grass and well concealed. Only the bird leaving as the grass was jarred revealed its location.

This nest with three incubated eggs was collected November 30, 1899, and December 30 just one month later another nest had been placed in the same spot and contained three fresh eggs. It is unusual for the Grassquit to build again where a nest has been disturbed.

I submit here the essential data of twenty-eight nests giving as they do the best possible idea regarding breeding; 1-3 Vieques, Nov. 15, '99. Fresh. Nest: fine grasses, rootlets and skeleton leaves, 7 feet from the ground in fork of bush in pasture. 2-2 Vieques, Nov. 19, '99. Fresh. Nest: fine rootlets, weeds and skleton leaves, 6 feet up in small bush by roadside. 3-3 Vieques, Nov. 19, '99. Heavily incubated. Nest: fine rootlets, weeds, skeleton leaves and grasses, 8 feet up in brush by roadside. 4-2 Vieques, Nov. 25, '99. Heavily incubated. Nest: grasses weedstems, rootlets and skeleton leaves, 4 feet from ground in top of bush by fence, near creek. 5-3 Vieques, Nov. 27, '99. One fresh, others slightly incubated. Nest: fine rootlets, skeleton leaves and grasses, 3 feet from ground, fairly hidden, in thick bush in clump of bushes in pasture. 6-3 Vieques, Nov. 30, '99. Heavily incubated. Nest: diameter 3¼ x 1¾; depth, 6 x 1¾ inches, of dry grass and skeleton leaves, 2½ feet above ground, in top of cactus (Spanish bayonet) and grass by edge of woods. 7-3 Vieques, Nov. 30, '99. Heavily incubated. Nest: diameter, 5 x 2¾; outside, 1¼ inside; depth, 4¼ x 2½ inches, entirely dry grasses, in wall of climbing grass, 5 feet from ground, entirely well hidden. 8-3 Vieques, Dec. 19, '99. Heavily incubated. Nest: diameter, 3½ x 2; depth, 9 x 1¾ inches of dried grasses, skeleton leaves, rootlets and horse-hair in tips of branch of tree 8 feet from ground over road. 9-3 Vieques, Dec. 30, '99. Fresh. Nest entirely of fine grasses in same spot as 7-3. 10-3 Vieques, Feb. 9, 1900. Fresh. Nest: fine roots, vines, weed stalks and skeleton leaves, in tips of slender bush, growing from mass of "Spanish bayonet", on bank of road, 10 feet from ground. 11-3 Vieques, Feb. 4, 1900. Fresh. Nest entirely of bits of dead vines in which it was built, in mass of dead vines hanging from tree, about 10 feet from ground. Nest closely imitated surrounding vines. 12-1 Vieques, Feb. 8, 1900. Fresh (incomplete—taken by friend). Nest usual material, 8 feet above roadbed, in tip of bush overhanging road from bank. 13-5 Aguadilla, May 27, 1900. Fresh. Nest: diameter, 4¾ x 3½ outside, 1½ inside; depth, 5¾ x 1½ inches, fine dry grasses, dead leaves, and few horse-hair, 5 feet up in coffee bush, in coffee grove, near house. 14-5 Aguadilla, June 9, 1900. Slightly incubated. Nest: diameter, 3½ x 1½, depth, 8 x 1½ inches, fine grass stems and dead leaves, 7 feet up in small mango tree in coffee grove near plantation house. 15-5 June 21, 1900, Aguadilla. Incubation about 4 days. Nest: diameter, 4 x 2⅛; depth, 5¾ x 2¼ inches, of fine weed-stems, dead leaves and rootlets, 12 inches above ground, in thick weed in open field. 16-4 Aguadilla, June 23, 1900. Heavily incubated. Nest: diameter, 5 x 7⅛; depth, 5½ x 1½ inches, fine vine, weed, and grass-stalks and leaves, in twigs against body of small mango tree close to plantation house. 17-3 Aguadilla, July 20, 1900. Incubation advanced. Nest: diameter, 3 x 3½; outside, 1¾; inside depth, 5 x 1¼, of fine grasses, rootlets and dead leaves, 8 feet up in mango tree in small grove near plantation house. 18-4 Aguadilla, July 23, 1900. Heavily incubated. Nest: diameter, 3½ x 2¾; outside, 2 inches; depth, 5¾ x 1¾ inches, of fine grasses, dead leaves and several bits of wild cotton. 19-3 Aguadilla, July 27, 1900. Slightly incubated. Nest: diameter, 4½ x 3½; outside, 2½; inside depth, 5¼ x 1¾ inches, of dead grasses, rootlets and leaves, 12 inches above ground in vine in cultivated field. 20-3 Mayaguez, Oct. 18, 1900. Fresh.

Nest: diameter, 4 x 3¼; outside, 2½; inside depth, 5¾ x 2½ inches, outwardly dead blades of grass, interior fine grasses and horse-hair, 2 feet above ground in tops of dense marshgrass beside a ditch, through low muddy cocoanut grove. 21-3 Mayaguez, Feb. 11, 19, 1901. Fresh. Nest: diameter, 5½ x 1¾; depth, 5 x 1½ of fine weedstalks, rootlets, grasses, leaves, one feather and few horsehairs, 2½ feet from ground in a foliage plant in flower beds at Infantry barracks. 22-3 Aguadilla, Feb. 22, 1901. Heavily incubated. Nest: diameter, 2⅝ x 2; depth, 4 x 2 inches, fine grasses and rootlets, 8 feet from ground, in large bush in open pasture. 23-3 Aguadilla, Feb. 25, 1901. Heavily incubated. Nest of fine straws, grasses and few horsehairs, 6 feet up in top of small mango stub, among shoots growing from same, in coffee grove. 24-3 same place and date. Heavily incubated. Nest of fine grasses, straw and weedstems, 5 feet up in coffee bush in small coffee grove. 25-3 Mayaguez, Feb. 26, 1901. Heavily incubated. Nest of fine dry grasses and few horsehairs, 2½ feet up in vine growing over bush in bushy tract of plantation. 26-3 Mayaguez, May 25, 1901. About 4 days incubation. Nest: diameter, 4 x 1¾; depth, 6½ x 2¼ inches, of fine grasses, weed-stalks and fibres, 5 feet up in small orange tree in cocoanut grove (this is the nest illustrated). 27-3 Mayaguez, May 26, 1901. Fresh. Nest: diameter, 3¾ x 2; depth, 5 x 2½ inches, of dried grasses and fine rootlets, 3 feet up in low bush in tangle on hillside. 28-3 same place and date. Incubation begun. Nest: diameter, 3½ x 1¾; depth, 4 x 1½ inches, of grasses, leaves and blades of rushes, 3 feet from ground, in bush in jungle on hillside. In each case inside depth given is from lower edge of entrance. A pair raised a brood in a cactus in barracks grounds and I tried to obtain a photo with set camera, but shyness and quickness of the bird combined to make the result a failure.

At first I thought the above dates of breeding showed a promiscuous more or less continuous nesting throughout the year. On examination however it seems to show three fairly well defined periods during which as many broods are reared. It will be noticed there are no records for January. During the latter part of that month birds at Vieques were nest building to some extent. Of the twenty-eight records eight were for February, more than for any other month showing this to be the period for incubating, first layings March and April have no records, the birds being at that time rearing their young and resting prior to the next attempt.

This seems not to commence till late May, and extends scatteringly into June. The few scattering July records may be sets laid, where a nest had been destroyed previously. During late, hot summer and the moulting season, and October gives but one record and not until the 18th of November, however, sees the bulk of the third layings for the season and the records come within one of equalling February. One of the two December records was undoubtedly a second attempt to raise the third brood and probably the other was also.

It will also be noted that the large sets seem to be laid in the second laying, in early summer, and of the twenty-eight sets twenty are of three eggs, two are two eggs, two are of four eggs, three are of five eggs and one was incomplete. [The illustrations referred to will appear in the next issue.—EDITOR.]

BOARD AND LODGING OF BIRDS.

In a Pennsylvania school journal we find the following novel suggestion which we feel certain will interest all our readers:

"We have found a very simple way of providing board in winter and lodging in summer for a great number of birds, says a Christian Work writer. You have only to buy a few cocoanuts, cut off the ends, like taking the top off an egg, which can easily be done with a sharp chisel and a mallet, bore holes through the sides, put a string through and knot it, and then hang the cocoanut from a creeper or bough. Thus for a few cents you can provide food for these lively little birds for weeks, or rather months. Last winter our cocoanuts were seldom let alone for many moments. Birds swarmed on them, lowering themselves down by a string, and at last, when confidence was quite established, flying straight in. They worked away at them from early morn till dewy eve. When all the nut is eaten the shells make excellent nesting places, and will probably be taken possession of by the same birds that hollow them out, if the shells are left out through the summer. In this way both board and lodging are provided on most reasonable terms, with no extras. In the hardest weather, this food supply is always available, and if you are away from home a few days you know that your little birds will not be in want.

We would suggest however, that a hole of moderate size, large enough to admit a sparrow, be cut into the side of the shell near the top and a few small ones at the bottom to permit any water which might enter by way of the large opening to drain out below; a most necessary measure if the shell is intended to serve as a nesting box later. A large cocoanut shell would be quite roomy enough for the housekeeping of such birds as Wrens, Chicakdees, English Sparrows, and even the Nuthatch.

We are by no means the only people who provide food for the birds in winter, nor is the practice a new one; we find it alluded to again and again in literature and even in pictures does this charitable act find representation. Such a picture came to our hands during the holidays, one representing "Yuletide" in Norway. It was with pleasure that we noted the sheaf of grain stuck up on a high pole as a Christmas gift for the birds in a scene of snow clad-Norway.

AN ALBINO VESPER SPARROW.

By R. W. Williams, Jr., Tallahassee, Florida.

While hunting five or six miles east of this city on the 22d day of January, 1902, I shot an albino Vesper Sparrow. The bird was feeding on the ground with several others of the same species and when flushed took refuge in a near-by pine, from which it was taken. Unfortunately I had no shot smaller than number 8 and the two penetrations, one in the back and the other in the fundament, so mutilated the specimen that I was unable to skin it nicely, though I made an effort to do so and progressed rather satisfactorily till the sternum was reached. Here I found a hard scab of some proportion and the skin was so closely attached to this scab that in my effort to remove it the skin was badly torn and ultimately ruined. Otherwise the body of the bird was in excellent condition. The remiges were much worn and but two rectrices remained. The only spots whatsoever, to sully the otherwise immaculate plumage were a few tiny dusky flakes confined to the frons. I sent the specimen to Mr. Ridgway who confirmed my identification.

THE THICK-BILLED REDWING.

A NEW BIRD RECORD FOR IOWA.

In the Proceedings of the Washington Academy of Science, Vol. iii, p. 153, April 1901, Mr. Robert Ridgway described *Agelaius phœniceus fortis.* He states (l. c.) "Similar to *A. p. phœniceus*, but decidedly larger, with bill relatively much shorter and thicker; adult females, adult males in winter, and immature males similar in coloration to the same of *A. p. sonoriensis* but distinguished by very different measurements. Breeding range unknown, but evidently somewhere in the central portion of North America, during migration occuring in Maintoba, Minnesota, Nebraska, Indian Territory, (Illinois, rarely or casually), and westward to and including the Rocky Mountains, and southward to Arizona, northern Chihuahua, New Mexico, and western Texas," The type was collected by Dr. R. W. Shufeldt at Omaha, Nebraska.

Mr. Ridgway has kindly examined the specimens of Redwings in my collection and pronounces the following *A. p. fortis* or Thick-billed Redwings:

No. 659. Skunk Riv. 10 m. S. of Burlington, Ia., Oct. 13, 1895, ♂ ad.
" 662. " " " " 12, 1895, ♂ juv.
" 663. " " " " 12, 1895, ♀ ad.
" 667. Henderson Co., Ill., Mch. 12, 1893, ♂ ad.
" 668. Mayfield, Ky., Dec. 15, 1894, ♂ ad.

Evidently all migrants.—Bartsch.

BIOGRAPHICAL NOTICE OF JOHN CASSIN.

By Theodore Gill.

The only ornithologist ever resident in the United States who paid special attention to "extralimital" birds, or those living outside of the American continents, was John Cassin. Up to his time American ornithologists were content to confine their serious studies to American birds and mainly to those confined within the limits of the United States. Cassin's sympathies and researches, however, were constrained within no artificial or political boundaries but extended to birds from all parts of the world. He certainly had a more extensive acquaintance with species or rather knew and could name more species by sight than any other American ornithologist. He commenced to publish the results of his studies in ornithology as early as 1844, and continued those studies with no serious intermission nearly up to his death. He was fortunate in having under his almost unrestrained direction what was for some time the most extensive ornithological collection extant. That collection was the fruit of his own knowledge and the munificence of his friend, Dr. Thomas B. Wilson, and that friend's brother, Mr. Edward Wilson.

Cassin, it must be remembered, began to publish the results of his studies at nearly the same time as, or very little later than, Brewer, Dekay, Gambel, Giraud and Lawrence, and also about the same time as Baird. Audubon was still flourishing and had much work still in store on mammals to do. Old-fashioned ideas of system were prevalent and most ornithologists were content to take the system as it was without troubling themselves very much about abstruse taxonomic questions.

Cassin was an early friend and correspondent of Baird and indeed before he himself had begun to publish on birds was the intermediary for the presentation (in July, 1843) of the latter's first article to the Academy of Natural Sciences. His humorous letter to Baird announcing its reception and delay in presentation was published in the Osprey for July, 1900 (iv, p. 173). His letters to Professor Baird are kept as an heirloom from her father by Miss Lucy H. Baird and a few will be hereafter published through her kindness.

Cassin's knowledge and ability were recognized not only in the United States, but throughout the world by those best qualified to judge. The very competent editor of the Ibis, Prof. Alfred Newton, echoed their appreciation on the occasion of recording his death in the Ibis for April, 1869 (n. s., v, 244): "Among the many ornithologists whose loss has been deplored in this Journal, there has not been one of such approved scientific reputation as the last who has been taken from us."

The only biographical notice of Cassin of any extent was contributed by his friend, Dr. Thomas Brewer, to the Boston Society of Natural History, February 1869, and published in their Proceedings (xii, 244-248,) and republished, in part, in the American Journal of Science for March, 1869 (2. s., xlvii, 292-293). The Academy of Natural Sciences of Philadelphia, at its meeting of "Jan. 19th," 1869, passed fitting resolutions respecting his death and resolved that "Science has suffered a loss which cannot be repaired; the loss of one who, more than any other student of Natural History in America, has advanced the science of ornithology", but no obituary notice was published by it. The American Philosophical Society, at its "stated meeting, January 15, 1869", was officially informed of his death by Dr. Leconte, and, on motion of Dr. Ruschenberger, "Dr. [Robert] Bridges was requested to prepare an obituary notice of the deceased" (p. 3), but Dr. Bridges, in a letter of February 20, "declined" the "appointment" (p. 23). Subsequently Professor Spencer F. Baird was appointed to prepare an obituary notice but never did so. A brief notice, already referred to, was published in the Ibis for April, 1869. A notice in 26 lines likewise appeared in Appleton's Cyclopædia of American Biography (i, 553, 554). Certainly Cassin was worthy of a better fate. To show what was thought and known of him at last, much of the notice by Dr. Brewer is now again published; but with a few necessary changes which preclude the use of quotation marks for the excerpts collectively.

John Cassin was born of Quaker parentage, in Chester, Pa., Sept. 6th, 1813. In 1834, at the age of twenty-one, he took up his abode in Philadelphia, where he continued to reside till his death. "In his earlier life he engaged in mercantile pursuits, and afterwards, for several years, held important positions under the national government. At the death of Mr. Bowen, the principal engraver of Philadelphia, he assumed the management of the establishment, which he continued until his death. All the reports of explorations and surveys issued by our government were largely indebted to him for the excellence of their illustrations."

For more than thirty years Mr. Cassin devoted all the leisure hours he could take from the requirements of his business to the study of ornithology. Privileged to reside in Philadelphia among the kindred spirits that compose its Academy, yet more privileged in having access to its wealth of ornithological specimens,—then the greatest in the world,—and to its even greater wealth in scientific works, where was to be found, procured by the munificence of his friend, the late Dr. Wilson, every known publication of any value on the subject of ornithology—with all these privileges no one could well have enjoyed greater advantages for pursuing his favorite study, and certainly no one could have better improved such rare opportunities.

"With a full appreciation of all that I aver," says Dr. Brewer, "I claim for my lamented friend, that as a general ornithologist, especially in regard to his knowledge of the forms of the Old World, Mr. Cassin had no superior either in this country or elsewhere—it may even be doubtful if he had an equal. By long and diligent study, by the most thorough investigations, and by the most careful researches into the authorities, with a patient perseverance that nothing could discourage, he rendered himself a complete master of the science. So perfectly familiar was he with the forms of the Old World, that he investigated their classification, established new genera and described new species as readily in Africa as in America, and the savans of Europe have accepted with deference his decisions''.

Mr. Cassin was for many years an active member of the Academy of Natural Sciences of Philadelphia, and had been a vice-president for some years up to his death. His valuable contributions enriched the pages of its Journal, and added wide reputation to its Proceedings. His activity and zeal in the cause of science aided to draw around that institution munificent patrons, as well as distinguished co-laborers.

His communications and all his contributions to science were distinguished by ''their careful research, their thoroughness, and their unfailing accuracy —an accuracy that was ever above reproach, and as it seems even beyond criticism''. So thought Dr. Brewer.

Nor was it alone as a closet naturalist that Mr. Cassin was distinguished. He was also an ardent lover of nature, and a close observer of living birds, both in their wild wood haunts, and under the open sky. Dr. Brewer, was indebted to him for much valuable information, derived from his observations upon the habits of various birds; and it was to aid from his unequalled knowledge that he looked forward for the correct classification of the collection of the Boston Society of Natural History.

As a man, Cassin was ''of unswerving uprightness, warm-hearted, cordial and sincere, firm and abiding in his friendship, and only a foe to whatever was wrong, ungenerous or illiberal—possessed of strong, fervent and generous impulses, and frank and outspoken in the expression of his opinions. Decided in his own views, he was still ever tolerant and liberal towards those who differed from him''.

Dr. Brewer's remarks may be supplemented by some from the present writer who saw considerable of him in 1860 and 1861, and who was entertained at his hospitable house on one occasion for several days on his way from New York to Washington.

Cassin was a man of striking personality, of medium height, somewhat stocky form, and in appearance reminded one of a prosperous farmer rather than a scientist. He had a florid complexion and deep bass voice and gave the idea of a very positive and assertive character. Better acquaintance proved that he was not as gruff as he at first appeared and he was a very companionable man. He was fond of books and quite a collector and his favorite harbor was in the back room of the second-story of his house which served as his library. He leaned toward the antiquarian side of book-collecting and took especial pride in his Linnæana. He had almost all the works of the great Swede and most of the editions of his Systema Naturæ. This antiquarian and historical tendency was manifest in the series of three articles, entitled "Fasti Ornithologicae" contributed to the Proceedings in 1865, 1866 and 1867, in which he reviewed the ornithological portions of the works of Philip Ludwig Statius Müller, der Naturforscher, and the Encyclopædia Londinensis.

In these articles, he resurrected a number of long-forgotten names and most of his determinations have been accepted and the names revived are still retained.

Cassin's forte was as a student of species and of various groups or families of birds so far as their species were concerned. He took little or no interest in anatomical studies or taxonomy based on such studies and limited his investigation to determination of species as represented by their skins. He was, indeed, a typical old-fashioned ornithologist, but one of the best of that type. He did not fear to differentiate generically birds that appeared to him to be too slightly related to others to be connected with them under a common generic designation. Apropos of relationship, he would not admit that what was so-called was really blood relationship or indicative of derivation from common ancestors of a remote past; in other words, he did not believe in what is now known as evolution. He was not, however, violently prejudiced against it and philosophically viewed it as a philosophical question. He was, indeed, somewhat fond of considering philosophical questions and frequently discussed such with his friend, Dr. Thomas Wilson. With that gentleman he composed, in 1863, an article "on a third Kingdom of organized beings," intermediate between the Animal and Vegetable.

In addition to his ornithological and literary studies and his regular business avocations, Cassin took much interest in the government of his adopted city, and served for some time in the city councils as representative of the ward in which he resided.

Cassin had a humorous bent which he freely indulged, and at one time he assisted in the publication of a comic periodical. No likeness of Cassin has ever been published so far as the present writer knows, and that now given will convey to many ornithologists some idea of the appearance of one of whom they have heard much, but have otherwise a vague idea about. It is reproduced from a photograph given by the subject to the writer in 1861.

A summary of his publications will be given in the next number of the Osprey.

REVIEWS.

Bird Portraits by Ernest Seton-Thompson with descriptive text by Ralph Hoffmann. Boston. Ginn & Co. 1901. [4to, pl. 1-20; pp. 1-40. Cloth with fancy cover design. Price, $1.50.]

In Bird Portraits we have a collection of twenty excellent half tone reproductions of drawings by a master artist representing the following species: Song Sparrow, Flicker, Brown Thrasher, Barn Swallow, Chimney Swift, Kingbird, Baltimore Oriole, Wood Thrush, Scarlet Tanager, Rose-breasted Grosbeak, Redstart, Ruby-throated Humming Bird, Bob-white, Goldfinch, Blue Jay, Brown Creeper, Butcher Bird, Golden-crowned Kinglet, Herring Gull and Chickadee.

Each plate is accompanied by a well-written biographical sketch of the subject by Ralph Hoffmann.

We are somewhat surprised to note that Mr. Seton-Thompson represents the Barn Swallow as nesting in small colonies under eaves of barns, a fact, we believe, heretofore not recorded. The Orioles' nest, too, we would have stretched somewhat to permit the lady to sink completely out of sight, while we would have allowed the Hummer, poising before the flower, to bring his wings much farther downward than here represented, but no doubt the author had his reasons for each of these, and we heartily join our voice with others in praise of such a happy collection of pleasing views.

Audubon Bird Chart No. 2, and Common Birds. Second Series. New York and Boston. The Prang Educational Company.

Some time ago the publishers issued an "Audubon Bird Chart" under the auspices of the Massachusetts Audubon Society. This contained life size figures, fairly accurate both as to characteristic attitudes and color, of the following twenty-six birds.

Barn Swallow, Black-and-White Creeper, Bluebird, Blue Jay, Bobolink, Chickadee, Catbird, Chimney Swift, Cedarbird, Chipping Sparrow, Downy Woodpecker, Golden-crowned Kinglet, Golden-winged Woodpecker, Goldfinch, Humming Bird, House Wren, Kingbird, Purple Finch, Phoebe, Red-eyed Vireo, Robin, Red-winged Blackbird, Song Sparrow, Scarlet Tanager, Summer Yellowbird, Wood Thrush.

The chart, which is 29 x 42 inches, was accompanied by a small pamphlet of twenty-five pages prepared by Mr. Ralph Hoffmann for the Audubon Society, giving short biographies of each figured form.

A second chart has been published this year by the same company figuring the following species:

Yellow-billed Cuckoo, Red-headed Woodpecker, Whip-poor-will, Phoebe, Wood Pewee, Least Flycatcher, Cowbird, Meadowlark, Bronzed Grackle, Vesper Sparrow, Towhee, Cardinal, Rose-breasted Grosbeak, Indigo Bunting, White-bellied Swallow, Warbling Vireo, Yellow-throated Vireo, Chestnut-sided Warbler, Black-throated Green Warbler, Pine Warbler, Oven-bird, Maryland Yellow-throat, Redstart, Brown Thrasher, White-bellied Nuthatch, Veery.

This is likewise accompanied by a pamphlet of short biographical sketches by the same author.

We believe that these charts and pamphlets will prove to be of interest to the teachers of our grammar schools as well as those of the higher grades.

Proceedings | of the | Nebraska Ornithologists' Union, | at the | Second Annual Meeting | Omaha, Neb., Jan. 12, 1901 | Lincoln, Neb., | State Journal Company Printers | October, 1901. [pp. 1-101, pl. i-x.]

A neat little copy containing many notes and pleasing sketches of bird-life. The following is a list of the papers. "President's Address: Ornithology in Nebraska, and State Ornithological Societies; I. S. Trostler. Birds in their Relation to Agriculture; Lawrence Bruner. Injurious Traits of the Blue Jay; E. D. Howe. Ornithology in the Schools; Wilson Trout. Birds as Objects of Study in the Grades; Chas. Fordyce. Nest of the Ruby-throated Hummingbird; F. H. Shoemaker. Young Rose-breasted Grosbeaks; Elizabeth van Sant. Breeding of the Prothonotary Warbler; M. A. Carriker, jr. Observations on Traill's Flycatcher; M. A. Carriker, jr. Breeding-habits of Bell's Vireo (*Vireo bellii*); Merritt Cary. Notes Regarding a Chimney Swift Tree; I. S. Trostler. Birds that Nest in Nebraska; Lawrence Bruner. A Peculiar Disease of Birds' Feet; E. H. Barbour. Internal Prairies of Nebraska Birds; Henry B. Ward. Changes in the Bird Fauna of the Prairies; L. Lessions. Birds of Northwestern Nebraska; J. M. Bates. Collecting Trips to Sioux County; J. C. Crawford, jr. Collecting Trip in Cherry County; J. S. Hunter. Birds from Western Nebraska; A. R. Graves. Migration Records and Nebraska Records; R. H. Wolcott. Miscellaneous Notes.

The plates represent, I, a Chimney Swift Tree; II-IV, Nest of the Ruby-throated Hummingbird; V-IX Young Rose-breasted Grosbeaks; X a Peculiar Disease of Birds Feet.

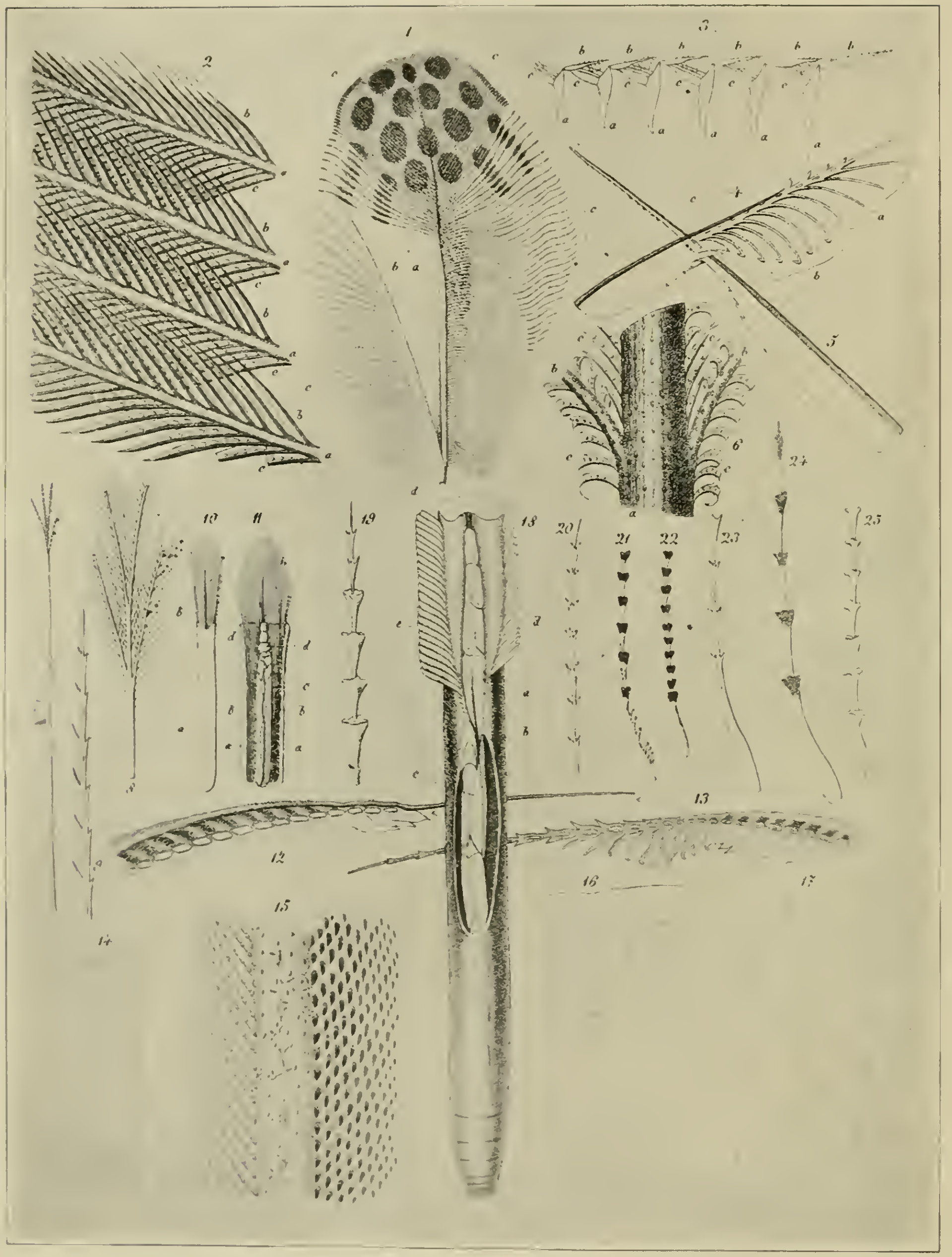
Darwin's "Origin of Species," originally issued in 1859, is reported about to be republished by several publishers, but these new editions can only be reprints of the first edition. All this is in consequence of the expiration of the copyright of the original edition. Mr. Murray, the original publisher, will present a shilling issue of the last edition revised by Darwin himself.

OBITUARIES.

Death of Hugh Alexander Macpherson.—Hugh Alexander Macpherson, a British ornithologist of considerable distinction, was born in Calcutta, (India) in 1849, the descendant of a family distinguished in educational circles. His father (Mr. William Macpherson of Trinity College, Cambridge) was the editor of the celebrated "Quarterly Review" and his grandfather Professor of Greek at Aberdeen. Young Macpherson, after his preliminary education, entered Oriel College, Oxford, graduated as B. A. in 1881, and received M. A. in 1884. He was ordained in 1882, and served as curate in Carlisle, London, and Ptilochry in the central Highlands. At the last place he died, after a brief illness, on the 26th of November, 1901.

He was the author of "many hundreds of articles and paragraphs" in "the Zoologist" and other periodicals, and several volumes on various zoological subjects. His ornithological works were on the "Birds of Cumberland" (1886), the "Visitation of Pallas's Sand Grouse to Scotland in 1888 (1889), "A Handbook of British Birds" (1891), "The Vertebrate Fauna of Lakeland", etc., (1892), the ornithographic portions of the volumes on the Partridge and Grouse of the "Fur and Feather series" (1893), the History of Fowling (1897), the text of the volumes on Birds of the "Royal Natural History" from Corvidæ to Cœrebidæ, and the Tubinares of the "British Birds, their nests and eggs".

Death of Alpheus Hyatt.—On the 15th of January, Prof. Alpheus Hyatt died suddenly of heart disease at Cambridge, Mass. He was, to all external manifestations, as well as usual and in the street awaiting a car when he was seen to abruptly lose his balance and fall to the ground. He was born at Washington, D. C., April 5, 1838, and consequently was near the end of his sixty-fourth year. After his preliminary education, he went in 1858 to the Lawrence Scientific School of Harvard University, attracted there by the fame of Agassiz, and graduated in 1862. He immediately afterwards enlisted in the army, was promoted to a captaincy, and was mustered out after nine months' service in 1863. He returned to Harvard and renewed his studie under Agassiz. In 1867 he was made a curator of the Essex Institute; in 1869, a curator of the Peabody Academy of Science; in 1881, professor f zoology and paleontology in the Massachusetts Institute of Technology, ad subsequently held various other positions. His life-work was chiefly on the fossil cephalopods, but he paid attention to various other groups, and ese-cially to the sponges. He began to catalogue the Birds of the Boston Socity of Natural History, but only completed one number, a catalogue of he Spheniscidæ (1872).



THE FEATHERS OF BIRDS. (AFTER NITZSCH.)

EXPLANATION OF PLATE (AFTER BURMEISTER.)

Fig. 1. A dorsal feather of *Argus giganteus* of the natural size, seen from beneath, in which the left series of barbs on the main shaft, and also the right series on the after-shaft, have been removed, in order to render the relations of the two shafts more distinctly perceptible. *a.* The thickened portion of the main shaft, with its longitudinal furrow. *b.* The after-shaft. *c, c, c.* The barbs of both shafts. *d.* The short, obtuse tube.

Fig. 2. Four barbs of the same feather from the upper part, with their barbules, seen from above under a moderate magnifying power. *a.* The barbs. *b.* Barbules of the anterior series, on which the hooklets are seated. *c.* Barbules of the posterior series, without hooklets.

Fig. 3. Six barbs (*a*, *a*, *a*) in transverse section, viewed from the cut surface, with their anterior (*b*, *b*, *b*) and posterior (*c*, *c*, *c*) barbules. From the outer side of the vane of one of the remiges of a goose, moderately enlarged.

Fig. 4. An anterior barbule of the same feather, strongly magnified, with its hooklets (*b*) and cilia (*a*).

Fig. 5. A posterior barbule of the same feather, equally magnified.

Fig. 6. A portion of the feather shown in fig. 1, seen from above, in which *a* is the main shaft and *b*, *b*, two of its barbs, from which issue the curiously curved laminar barbules, still without hooklets or cilia. This figure is particularly intended to show that even the main shaft bears barbules when the barbs stand far apart.

Fig. 7. The filoplume of a goose, moderately enlarged.

Fig. 8. The upper extremity of the same, with the tips cut off, more strongly magnified.

Fig. 9. A barbule of the same feather, very strongly magnified. The cavities of the cells may still be recognized in it.

Fig. 10. A young goose-feather, seen from in front, just protruding the apex of the vane (*b*) from the follicle (*a*).

Fig. 11. The same from behind, opened longitudinally. *a.* The follicle. *b*, *b.* Feather-material. *c.* Matrix, with its blood-vessels. *d*, *d.* Cast-off and desiccated portions of the latter.

Fig. 12. An immature barbule, of the posterior series, of a grey pigeon's feather.

Fig. 13. An immature barbule of the anterior series of the same feather.

Fig. 14. The lower portion of a barb, in which no distinction can yet be recognized between it and its barbules, consisting of homogeneous cells and their nuclei. Taken from the feather represented in fig. 10.

Fig. 15. A portion of an immature barb, in which the barbules are already indicated, but not yet divided off; on the left those of the hinder and on the right those of the anterior series. Taken from a grey pigeon's feather.

Fig. 16. Modified cells, becoming converted into solid horny substance, from the uppermost layer of a young barb of this same feather.

Fig. 17. The cells of the epithelium of which the follicle consists, with their nuclei and nucleolar corpuscles.

Fig. 18. The lower extremity of one of the wing-feathers of a pigeon, in which the tube has been laid open by a cut, and the main shaft and barbs are cut off short; the lowest barbs immediately above the tube are also removed. *a.* Dry cast-off remains of the matrix which project from the upper opening of the tube and lie in the furrow of the shaft. *b.* The position of the orifice, which has been removed by the cut. *c.* Dry cast-off portions of the matrix in the interior of the tube, which, like the preceding, are placed one within the other, like a row of thimbles. *d.* The outer, and *e*, the inner, side of the vane.

Fig. 19. White down-barbules of the domestic Duck, magnified 100 diameters. Taken from Nitzsch, in 'Voigt's Magazine,' &c., Bd. xi, Taf. 6.

Fig. 20. Down-barbules from the lower part of a contour-feather of the same Duck. Ibid.

Fig. 21. Beginning of a down-barbule from the lower part of a contour-feather of *Corvus glandarius*. Ibid.

Fig. 22. The same from *Sylvia rubecula*. Ibid.

Fig. 23. The same from the domestic Duck. Ibid.

Fig. 24. The same from *Strix otus*. Ibid.

Fig. 25. The same from the Turtle Dove. Ibid.

usually present, or by their presence where generally absent. Most noteworthy of such cases are the absence of feathers on the heads of some Vultures, and the presence of feathers on the feet, and even the toes, of Ptarmigans. Many game birds have special bare spaces on the neck which are very prominent in the male, during the breeding season.

THE ORIGIN, GROWTH AND CARE OF FEATHERS.

Birds have the thinnest skin of all vertebrates, and the feathers arise from it as epidermal formations upon a dermal papilla. These epidermal structures develope first as down-feathers, and their development may cease there, but in most cases the embryonic down-feather is replaced by a definitive feather. The second feather is formed directly beneath the first, and growing rapidly punches the down-feather out of its place, and comes to the surface. In its subsequent growth, one of the rays becomes rapidly thickened, and forms the *shaft* of the completed feather, upon the sides of which develope the barbs. Each growing feather is supplied with an artery and vein, which maintain an active circulation. When the growth is completed, however, the artery and vein, together with all the contents of the shaft and quill, become dried up, and the feather is no longer a living part of the bird, but simply a bit of dead skin. After a time, the feathers fall off, and new feathers are formed to replace them, and this losing of the old feathers is called the *moult.* As a rule moult is annual, but in some birds it is semi-annual. The annual moult occurs late in the summer, and the semi-annual very early in the spring, but this spring moult is often only partial. Ptarmigans are said to have a third moult late in the fall. Most birds are very careful of their plumage and some spend much time in cleaning, oiling and smoothing it. This process is spoken of as *preening* and is especially characteristic of bright-plumaged and song birds. Birds have no glands in the skin, but most species have a well-developed mass of oil-glands on the back, just above the base of the rectrices and hidden by the upper tail coverts. This mass is more or less triangular or heart-shaped and opens by one or more pores at the tip of a nipple-like projection. This projection is frequently surmounted by a circle of small feathers, around the openings, known as the *oil-gland tuft.* The oil-gland is specially well-developed in water-birds, while in land-birds it is smaller and sometimes absent. It is as large as a Pigeon's egg in the Pelican; it is wholly wanting in the Ostrich and its allies. Its presence or absence, and whether "tufted" or not, are important points in classification. The oil is pressed out by the bill of the bird and then spread upon the feathers, thus helping to make the plumage waterproof.

THE COLOR OF THE PLUMAGE.

The most conspicuous feature of the plumage of birds is undoubtedly the color. We have unfortunately no space to treat of this matter in detail at this time, though a few facts deserve attention. Color is confined almost wholly to the contour-feathers. Down and half-down are almost always white or yellowish, or some shade of gray or brown, and filoplumes are gray or black. Pulviplumes are generally yellowish. The color of contour-feathers is infinitely varied, but is most noticeable on the upper or outer-side of the feathers. It is determined by four factors, (1) the age and worn condition of the feathers, (2) the amount of air contained in the shaft and barbs, (3) pigment, and (4) the microscopic structure of the surface of the feathers. New or young feathers are more brightly colored than when they are old, and this is due, in part at least, to the wear and tear on the surface and edge of the feather. The amount of white in a feather depends upon the amount of air it contains; a pure white feather lacks pigment, and is practically full of air. Our knowledge of feather pigments is still imperfect and unsatisfactory,—blackish, yellowish, green and two red pigments being those which are best known. Other colors, particularly blue, and the metallic luster of feathers, are caused by the prismatic structure of the surface. The question whether fully grown feathers can change their color other than by the wearing away of surface and edges is still discussed, but the evidence accumulated in recent years seems to prove that they cannot. Of course their colors may fade as they grow old, but that they can in any way brighten up or undergo radical change seems to be out of the question.

Most of the colors appear to depend on optical and not chemical causes; the attempts made "to extract blue, violet, and green pigments from feathers so colored have as yet been unsuccessful."

There are, however, special coloring matters developed in some birds and many of these were discovered in 1881-82 by Dr. C. W. Krukenberg. These were examined both by chemical and spectroscopic analyses; especially have different substances been found in the red and yellow feathers of birds. The various pigments have been given the names *Turacin*, *Turacoverdin*, *Zoarubin*, *Zoonerythrin*, *Zoofuloin*, *Araroth*, *Corionilphurin*.

Turacin has only been detected in the feathers of the Plantain-eaters or Musophagidæ, and more especially in their red feathers. It "gives two different absorption-spectra, according to whether it is in solution or not—a very unusual circumstance with organic pigments. A solution-spectrum has two absorption-bands, nearly coinciding in position with those of oxyhæmoglobin, from which, however, Turacin differs greatly in chemical composition, containing, as is well known, copper in abundance."

Zoonerythrin "gives a continuous spectrum."

Zoofuloin affords a spectrum "with two absorption-bands which however are not those of Turacin."

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